

CLAIMS

1. A method for constructing an outerwear garment, the method comprising acts of:

- (A) providing a first outerwear material segment and a second
5 outerwear material segment, the first material segment comprising a first surface of a first material composition and a stitchless seam edge, the second material surface comprising a second surface of a second material composition and a stitchless seam edge;
- (B) applying at least one of a liquid bonding agent and a sheet
10 adhesive at the seam edge of at least the first surface of the first material segment;
- (C) overlapping the seam edge of the first material segment with the seam edge of the second material segment such that the first surface of the first material segment faces the second surface of the second material segment, thereby creating a
15 stitchless seam line, wherein the at least one of the liquid bonding agent and the sheet adhesive is disposed between the first and second material segments along the seam line; and
- (D) applying heat and pressure to the seam line to weld the seam line and join the material segments without stitching.

20 2. The method of claim 1, wherein the (A) act comprises providing material segments with a water resistant coating.

3. The method of claim 1, wherein the material segments each comprise two layers, a shell fabric layer and a breathable membrane layer.

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4. The method of claim 3, wherein the shell fabric layer is the first layer of the first material segment and the membrane layer is the second layer of the second material segment.

30 5. The method of claim 1, wherein the material segments each comprise three layers, a shell fabric layer, a breathable membrane layer and a backing fabric layer.

6. The method of claim 5, wherein the shell fabric layer is the first surface of the first material segment and the backing layer is the second surface of the second material segment.

5 7. The method of claim 1, wherein the seam edge of at least one material segment is die cut.

8. The method of claim 1, wherein the seam edge of at least one material segment is laser cut.

10 9. The method of claim 1, wherein the (B) act comprises applying a liquid bonding agent.

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15 10. The method of claim 9, wherein the liquid bonding agent is a polyurethane-based glue.

11. The method of claim 9, wherein the (B) act comprises applying the liquid bonding agent by screen printing.

20 12. The method of claim 1, wherein the (B) act comprises applying a sheet adhesive.

13. The method of claim 12, wherein the sheet adhesive is a thermoplastic adhesive film.

25 14. The method of claim 13, wherein the thermoplastic adhesive film is a polyurethane film.

30 15. The method of claim 13, wherein the thermoplastic adhesive film is a polyester film.

16. The method of claim 13, wherein the thermoplastic adhesive film is a nylon adhesive film.

17. The method of claim 1, wherein the (B) act comprises applying both a liquid bonding agent and a sheet adhesive.

18. The method of claim 1, wherein the (D) act comprises applying heat and pressure to the seam line by way of a metal welding mold.

19. The method of claim 1, further comprising the act of:
(E) arranging the material segments into a form of an outerwear garment.

20. An outerwear garment with welded seams, the garment comprising:
a first outerwear material segment and a second outerwear material segment, the first material segment comprising a first surface of a first material composition and a stitchless seam edge, the second material segment comprising a second surface of a second material composition and a stitchless seam edge; and
a seam joining the material segments together, wherein the seam comprises the seam edge of the second material segment overlapping the seam edge of the first material segment such that the second layer of the second material segment faces the first layer of the first material segment, thereby creating a stitchless seam line, wherein the seam line is bonded by at least one of a liquid bonding agent and a sheet adhesive.

21. The garment of claim 20, wherein the seam line is bonded by a liquid bonding agent.

22. The garment of claim 21, wherein the liquid bonding agent is a polyurethane-based glue.

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23. The garment of claim 20, wherein the seam line is bonded by a sheet adhesive.

24. The garment of claim 23, wherein the sheet adhesive is a thermoplastic adhesive film.

25. The garment of claim 24, wherein the thermoplastic adhesive film is a polyurethane film.

26. The garment of claim 24, wherein the thermoplastic adhesive film is a polyester film.

27. The garment of claim 24, wherein the thermoplastic adhesive film is a nylon adhesive film.

28. The garment of claim 20, wherein the seam line is bonded by both a liquid bonding agent and a sheet adhesive.

29. The garment of claim 20, wherein the material segments comprise a water resistant coating.

30. The garment of claim 20, wherein the material segments do not include a membrane.

31. The garment of claim 20, wherein the material segments each comprise two layers, a shell material layer and a breathable membrane layer.

32. The garment of claim 31, wherein the shell fabric layer of the first material segment is joined to the membrane layer of the second material segment by at least one of a liquid bonding agent and a sheet adhesive.

33. The garment of claim 20, wherein the material segments each comprise three layers, a shell fabric layer, a breathable membrane layer and a backing fabric layer.

34. The garment of claim 33, wherein the shell fabric layer of the first material segment is joined to the backing layer of the second material segment by at least one of a liquid bonding agent and a sheet adhesive.

35. The garment of claim 20, wherein the seam edge of at least one material segment is die cut.

36. The garment of claim 20, wherein the seam edge of at least one material segment is laser cut.

37. A method for constructing an outerwear garment, the method comprising acts of:

(A) providing first and second outerwear material segments, each material segment comprising a seam edge;

(B) applying both a liquid bonding agent and a sheet adhesive at the seam edge of at least the first material segment;

(C) overlapping the seam edge of the first material segment with the seam edge of the second material segment, thereby creating a seam line, wherein the liquid bonding agent and the sheet adhesive are disposed between the material segments the along the seam line; and

(D) applying heat and pressure to the seam line to weld the seam line.

38. The method of claim 37, wherein the (A) act comprises providing material segments with a water resistant coating.

39. The method of claim 37, wherein the material segments do not include a membrane.

40. The method of claim 37, wherein the material segments each comprise two layers, a shell fabric layer and a breathable membrane layer.

41. The method of claim 40, wherein the shell fabric layer of the first material
5 segment is joined to the membrane layer of the second material segment using both the liquid bonding agent and the sheet adhesive.

42. The method of claim 40, wherein the shell fabric layer of the first material
10 segment is joined to the shell fabric layer of the second material segment using both the liquid bonding agent and the sheet adhesive.

43. The method of claim 37, wherein the material segments each comprise three layers, a shell fabric layer, a breathable membrane layer and a backing fabric layer.

44. The method of claim 43, wherein the shell fabric layer of the first material
15 segment is joined to the backing layer of the second material segment using both the liquid bonding agent and the sheet adhesive.

45. The method of claim 43, wherein the shell fabric layer of the first material
20 segment is joined to the shell fabric layer of the second material segment using both the liquid bonding agent and the sheet adhesive.

46. The method of claim 37, wherein the liquid bonding agent is a polyurethane based glue.

47. The method of claim 37, wherein the liquid bonding agent is applied by
25 screen printing.

48. The method of claim 37, wherein the sheet adhesive is a thermoplastic
30 adhesive film.

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49. The method of claim 48, wherein the thermoplastic adhesive film is a polyurethane film.

50. The method of claim 37, wherein the seam edge of at least one material
5 segment is die cut.

51. The method of claim 37, wherein the seam edge of at least one material segment is laser cut.

10 52. An outerwear garment with welded seams, the garment comprising:
a first outerwear material segment and a second outerwear material
segment, each material segment comprising a seam edge; and
a seam joining the material segments together, wherein the seam
comprises the seam edge of the second material segment overlapping the seam edge of
15 the first material segment, thereby creating a seam line, wherein the seam line is bonded
by both a liquid bonding agent and a sheet adhesive.

53. The garment of claim 52, wherein the liquid bonding agent is a
polyurethane-based glue.

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54. The garment of claim 52, wherein the sheet adhesive is a thermoplastic
adhesive film.

55. The garment of claim 54, wherein the thermoplastic adhesive film is a
25 polyurethane film.

56. The garment of claim 52, wherein the material segments comprise a water
resistant coating.

30 57. The garment of claim 52, wherein the material segments do not include a
membrane.

58. The garment of claim 52, wherein the material segments each comprise two layers, a shell material layer and a breathable membrane layer.

59 The garment of claim 58, wherein the shell fabric layer of the first
5 material segment is joined to the membrane layer of the second material segment by both the liquid bonding agent and the sheet adhesive.

60. The garment of claim 58, wherein the shell fabric layer of the first material segment is joined to the shell fabric layer of the second material segment by
10 both the liquid bonding agent and the sheet adhesive.

61. The garment of claim 52, wherein the material segments each comprise three layers, a shell fabric layer, a breathable membrane layer and a backing fabric layer.

62. The garment of claim 61, wherein the shell fabric layer of the first
15 material segment is joined to the backing layer of the second material segment by both the liquid bonding agent and the sheet adhesive.

63. The garment of claim 60, wherein the shell fabric layer of the first
20 material segment is joined to the shell fabric layer of the second material segment by both the liquid bonding agent and the sheet adhesive.

64. The garment of claim 52, wherein the seam edge of at least one material
segment is die cut.

65. The garment of claim 52, wherein the seam edge of at least one material
25 segment is laser cut.

66. A method for constructing an outerwear garment, the method comprising
30 acts of:

(A) providing a first outerwear material segment and a second outerwear material segment, the first material segment comprising a first surface of a

first material composition and a stitchless seam, the second material segment comprising a second surface of a second material composition and a stitchless seam edge;

(B) providing a bonding substance to bond the material segments;

(C) overlapping the seam edge of the first material segment with the
5 seam edge of the second material segment such that the first surface of the first material segment faces the second surface of the second material segment, thereby creating a stitchless seam line, wherein the bonding substance is disposed along the seam line; and

(D) applying heat and pressure by way of a welding mold to the seam line to weld the seam line and join the material segments without stitching.

10 67. The method of claim 66, wherein the (A) act comprises providing material segments with a water resistant coating.

68. The method of claim 66, wherein the material segments each comprise
15 two layers, a shell fabric layer and a breathable membrane layer.

69. The method of claim 68, wherein the shell fabric layer of the first material segment is joined to the membrane layer of the second material segment by the bonding substance.

20 70. The method of claim 65, wherein the material segments each comprise three layers, a shell fabric layer, a breathable membrane layer and a backing fabric layer.

70. The method of claim 70, wherein the shell fabric layer of the first material
25 segment is joined to the backing layer of the second material segment by the bonding substance.

72. The method of claim 66, wherein providing a bonding substance comprises applying at least one of a liquid bonding agent and a sheet adhesive to the
30 seam edge of the first surface of the first material segment.

73. The method of claim 72, wherein applying at least one of a liquid bonding agent and a sheet adhesive comprises applying a liquid bonding agent.

74. The method of claim 73, wherein the liquid bonding agent is a
5 polyurethane based glue.

75. The method of claim 73, wherein the liquid bonding agent is applied by screen printing.

10 76. The method of claim 72, wherein applying at least one of a liquid bonding agent and a sheet adhesive comprises applying a sheet adhesive.

77. The method of claim 76, wherein the sheet adhesive is a thermoplastic adhesive film.

15 78. The method of claim 77, wherein the thermoplastic adhesive film is a polyurethane film.

20 79. The method of claim 77, wherein the thermoplastic adhesive film is a polyester film.

80. The method of claim 77, wherein the thermoplastic adhesive film is a nylon adhesive film.

25 81. The method of claim 72, wherein the act of applying at least one of a liquid bonding agent and a sheet adhesive comprises applying both a liquid bonding agent and a sheet adhesive.

82. The method of claim 66, wherein the welding mold is between 0.25 cm
30 and 1.75 cm wide.

83. The method of claim 66, wherein the welding mold is curved.

84. The method of claim 66, wherein the welding mold applies pressure simultaneously to an extended length of the seam.

5 85. The method of claim 84, wherein the welding mold applies pressure simultaneously to more than a 1 inch seam length.

86. A method for constructing an outerwear garment, the method comprising acts of:

10 (A) providing first and second outerwear material segments, each material segment comprising a seam edge;

(B) applying both a liquid bonding agent and a sheet adhesive to the seam edge of the first material segment;

(C) overlapping the seam edge of the second material segment with
15 the seam edge of the first material segment, thereby creating a seam line, wherein the liquid bonding agent and the sheet adhesive are disposed between the material segments along the seam line; and

(D) applying heat and pressure by way of a welding mold to the seam line to weld the seam line.

20 87. The method of claim 86, wherein the liquid bonding agent is a polyurethane based glue.

88. The method of claim 86, wherein the liquid bonding agent is applied by
25 screen printing.

89. The method of claim 86, wherein the sheet adhesive is a thermoplastic adhesive film.

30 90. The method of claim 89, wherein the thermoplastic adhesive film is a polyurethane film.

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91. The method of claim 86, wherein the (A) act comprises providing material segments with a water resistant coating.

92. The method of claim 86, wherein the material segments do not include
5 membranes.

93. The method of claim 86, wherein the material segments each comprise two layers, a shell fabric layer and a breathable membrane layer.

10 94. The method of claim 93, wherein the shell fabric layer of the first material segment is joined to the membrane layer of the second material segment using both the liquid bonding agent and the sheet adhesive.

15 95. The method of claim 93, wherein the shell fabric layer of the first material segment is joined to the shell fabric layer of the second material segment using both the liquid bonding agent and the sheet adhesive.

20 96. The method of claim 86, wherein the material segments each comprise three layers, a shell fabric layer, a breathable membrane layer and a backing fabric layer.

97. The method of claim 96, wherein the shell fabric layer of the first material segment is joined to the backing layer of the second material segment using both the liquid bonding agent and the sheet adhesive.

25 98. The method of claim 96, wherein the shell fabric layer of the first material segment is joined to the shell fabric layer of the second material segment using both the liquid bonding agent and the sheet adhesive.

30 99. The method of claim 86, wherein the welding mold is between 0.25 cm and 1.75 cm wide.

100. The method of claim 86, wherein the welding mold is curved.

101. The method of claim 86, wherein the seam is stitchless.

102. The method of claim 86, wherein the welding mold applies pressure
5 simultaneously to an extended length of the seam.

103. The method of claim 102, wherein the welding mold applies pressure
simultaneously to more than a 1 inch seam length.

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